

(12) UK Patent Application (19) GB (11) 2 137 601 A

(43) Application published 10 Oct 1984

(21) Application No 8408934

(22) Date of filing 6 Apr 1984

(30) Priority data

(31) 8309699

(32) 9 Apr 1983

(33) GB

(51) INT CL³
B65D 55/02

(52) Domestic classification
B8T 13A HSA

(56) Documents cited
GB A 2099801
GB A 2060582

US 4285437

(58) Field of search
B8T

(71) Applicant
Mardon Illingworth Limited (United Kingdom),
Forest Works, Coxmoor Road, Sutton-in-Ashfield,
Nottinghamshire NG17 5LH

(72) Inventor
Henryk Dudzik

(74) Agent and/or Address for Service
Eric Potter & Clarkson,
14 Oxford Street, Nottingham NG1 5BP

(54) Child-resistant container cap

(57) The cap comprises a closure part (11) screw-engageable on a container and a sleeve (20) captive on and rotatable relative to the closure part (11). Ratchet members (14, 24) can interengage as the sleeve is turned clockwise to screw the closure member onto the container, but slide over each other during reverse rotation. The closure part has a downwardly opening pocket (38) which can receive a projection (30) on the sleeve by axial lifting of the sleeve to permit unscrewing of the cap, but in only one relative rotational position determined by alignment of markers (17, 29). Various ramp surfaces (40, 18a) prevent engagement of other surfaces.

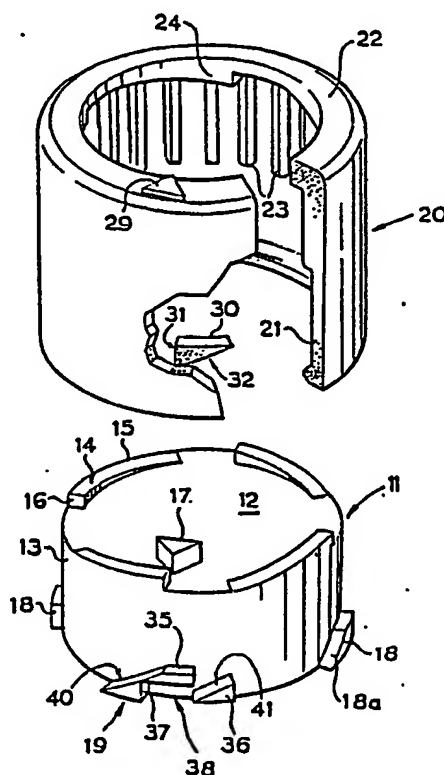


FIG. 1

GB 2 137 601 A

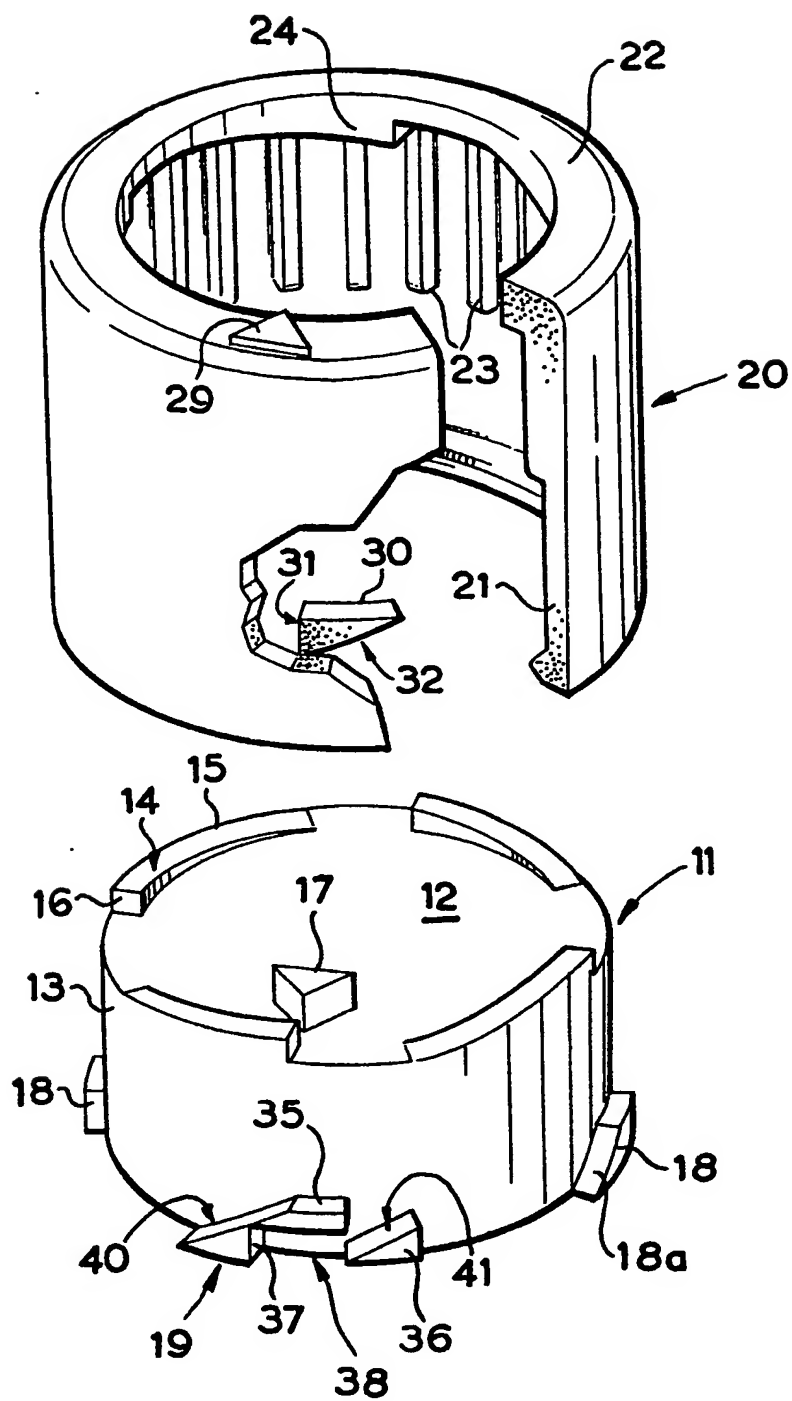


FIG. 1

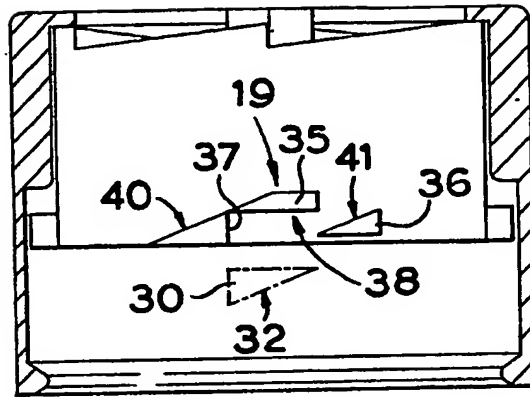


FIG. 2

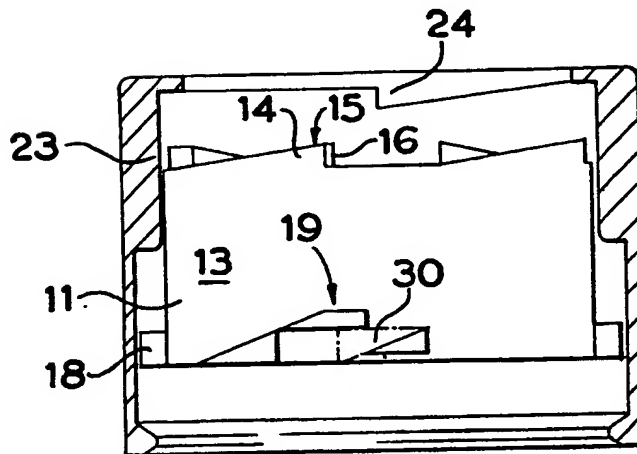


FIG. 3

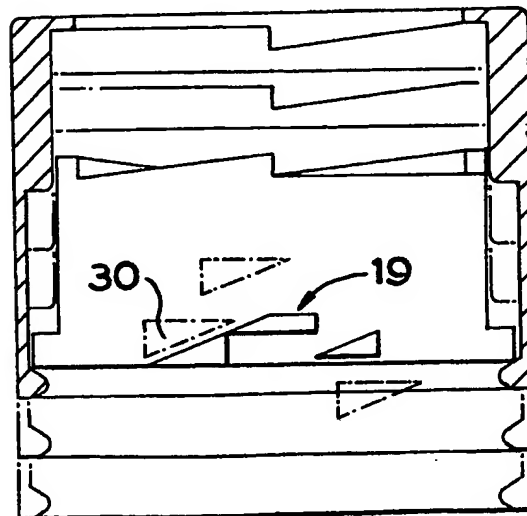


FIG. 4

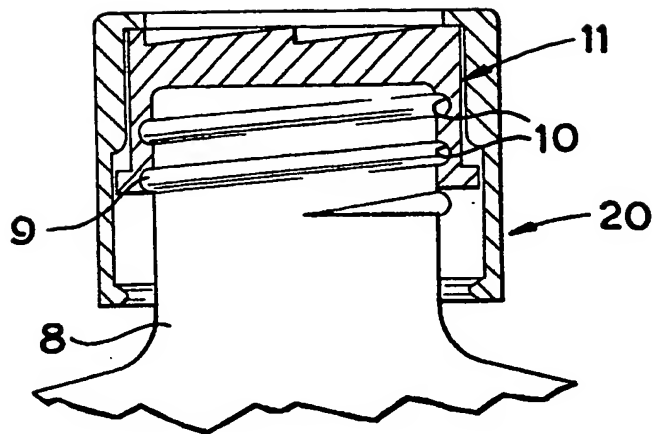


FIG. 5

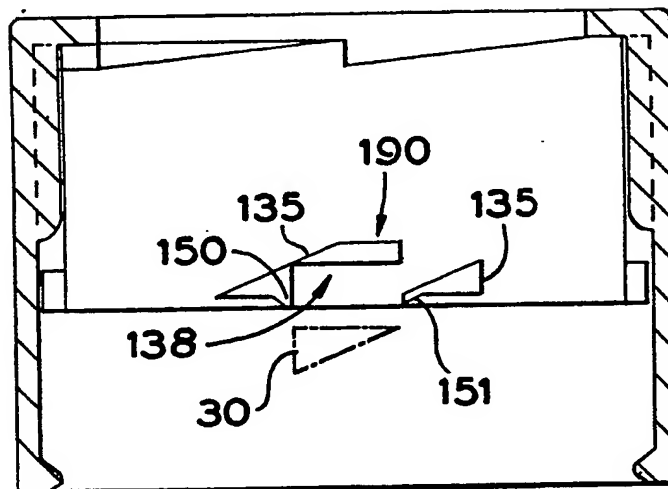


FIG. 6

SPECIFICATION

Child-resistant container cap

- 5 This invention relates to a child-resistant container cap.

Caps for medicine containers are often made child-resistant and this is usually effected by making it necessary to use force greater than can usually be exerted by a child. A ratchet arrangement is commonly used between a closure part of the cap and a surrounding sleeve, so that rotation of the sleeve in one direction will screw the cap onto the container, whereas reverse rotation causes rotation of the sleeve relative to the closure part. Considerable downward force needs to be exerted to achieve engagement of elements, which permit unscrewing of the closure part. This also makes it difficult for other people, for example, older people or those with arthritic hands, to unscrew the cap and it is common for people to remove the sleeve and use the closure part as a simple cap.

The present invention provides a cap, which can easily be removed from a container, but which is still child-resistant, particularly against opening by younger children, who are most at risk.

In accordance with this invention, a child-resistant container cap comprises a closure part having a skirt provided with means permitting engagement with a container by rotation in a closing direction and removal by rotation in the reverse direction, and a sleeve surrounding the skirt and captive on the closure part and being axially movable relative to the closure part, means on the closure part and the sleeve permitting rotation of the closure part by the sleeve in said closing direction and permitting rotation of the sleeve relative to the closure part in said reverse direction in a first axial position of the sleeve relative to the closure part, and engageable means on the closure part and the sleeve permitting rotation of the closure part by the sleeve in said reverse direction in a second axial position of the sleeve relative to the closure part, the engagement means being arranged so that they are capable of mutual engagement by axial movement of the sleeve relative to the closure part in only one predetermined precise relative angular position of the sleeve and the closure part.

It is preferred that the sleeve and the closure part carry indicator means, which are aligned in said predetermined angular position of the sleeve and the closure part.

The first engagement means preferably defines a pocket, which receives the second engagement means in said predetermined angular position. It is advantageous for the first engagement means defining the pocket to have a ramp surface engageable by the second engagement means to deflect the latter away from engagement when the sleeve and the closure part are not in said predetermined angular position.

Reference is now made to the accompanying drawings, wherein:-

Figure 1 is an exploded perspective view of a child-resistant cap according to the invention;

Figures 2,3 and 4 are diagrammatic sectional views, showing different relative positions of a sleeve and a closure part; of the cap;

Figure 5 is a sectional view of the cap shown mounted on a bottle neck; and

Figure 6 is a view similar to Figure 2, showing a modification of the cap.

The cap of Figures 1 to 5 comprises a closure part 11 and a sleeve 20. The closure part 11 has a top 12 and a skirt 13. The inner periphery of the skirt is provided with a screwthread 10 (Figure 5) for engagement with a complementary screwthread 9 on a container neck 8. The top 12 of the closure part has peripheral upstanding arcuate projections 14 in a castellated arrangement. These projections 14 have sloping top surfaces 15 and upright end faces 16 to define a triangular shape.

A triangular marker 17 also projects upwardly from the top 12 and there are also provided captivating lugs 18 and engagement means 19, the purposes of which are described below.

The sleeve 20 has a skirt 21 and an annular top flange 22. The interior of the skirt is provided adjacent the flange with axial locating ribs 23, which engage with the exterior of the skirt 13 of the closure part 11. The flange 22 has downwardly projecting members 24, which are complementary to the projections 14 on the closure part and define therewith a ratchet.

The sleeve 20 snap-engages on the closure part, with the captivating lugs 18 engaging beneath the ribs 23 to permit limited axial movement of the sleeve on the closure part.

When downward axial force is exerted on the sleeve (e.g. under gravity) the ratchet members and ratchet projections 24, 14 engage, so that turning of the sleeve clockwise effects turning of the closure part to screw the latter onto a container neck 8. Anti-clockwise movement of the sleeve causes the members 24 to slide over the projections 14 with no corresponding movement of the closure part.

The skirt 21 of the sleeve 20 has an inner projection defining an engagement element 30. The engagement element is generally triangular (although arcuate in plan view) having an axial shoulder 31 and a sloping undersurface or ramp surface 32.

The engagement means 19 of the closure part co-operates with the engagement element 30 and comprises a first portion 35 and a second portion 36. The first portion 35 has on its underside a rebate 37, at an open side of which is located the second portion 36 to define a downwardly opening pocket 38. The arcuate length of the pocket is slightly greater than that of the engagement element 30, which can be received in the pocket.

The first portion 35 has a ramp surface 40 defining its face opposite to the second portion 36. The second portion 36 has a ramp surface 41 facing the rebate 37. The ramp surface 32 of the engagement element 30 is arranged so that it can engage the ramp surface 40 of the first portion 35, during anti-clockwise rotation of the sleeve.

If the engagement element 30 is exactly axially aligned with the pocket 38, then upward axial

movement of the element engages it in the pocket. Anti-clockwise rotation of the sleeve then engages the ramp surface 32 with the ramp surface 41 in a wedging action in the pocket. Continued anti-

5 clockwise rotation, therefore, moves the closure part 11, unscrewing the latter from the container neck 8.

When the sleeve is axially depressed and turned clockwise, for screwing down the cap, the engagement element 30 is taken out of engagement with
10 the pocket, so that the ratchet members 24 and projections 14 are operative.

Unscrewing of the cap is only possible if the engagement element 30 is first angularly aligned with the pocket and then axially moved into the
15 pocket. In any other relative angular position, the sleeve will turn relative to the closure part. The ramp surface 40 prevents the engagement element 30 from positively engaging with the engagement means 19, since the element will ride up the ramp
20 surface. The slope of the ramp surface 32 may be different from that of surface 40 to ensure that there are not large areas of the two surfaces in contact. Similarly, each of the captivating lugs 18 has a ramp surface 18a to prevent positive engagement of the
25 engagement element 30 with a lug. The underside of the second portion 36 is axially offset above the underside of the first portion 35, to ensure that the engagement element 30 cannot contact the second portion 36 during anti-clockwise rotation, so as to
30 locate the element adjacent the pocket.

As seen in Figure 2, the flange 22 is provided with a triangular marker 29. This marker is aligned with the other marker 17 on the closure part 11 to indicate when the engagement element 30 is aligned with the
35 pocket 38.

Figures 2 to 4 show various relative positions of the engagement element 30 and the engagement means 19, but the element 30 is shown detached from the sleeve, so as more clearly to illustrate the
40 operation.

Figure 6 shows a modification. The undersides of the second portion 136 and the first portion 135 of the engagement means 119 are in the same radial plane, but adjacent the pocket 138, these undersides
45 have ribs 150, 151. The face of the rib 150 on the first portion 135, which face may engage the engagement element 30 during anti-clockwise movement of the sleeve, is sloped, so as to direct the element away from the pocket. The other rib 151 has its face,
50 which may engage the element 30 during clockwise movement of the sleeve, sloped so as to direct the element away from the pocket.

CLAIMS

55 1. A child-resistant container cap comprising a closure part having a skirt provided with means permitting engagement with a container by rotation in a closing direction and removal by rotation in the
60 reverse direction, and a sleeve surrounding the skirt and captive on the closure part and being axially movable relative to the closure part, means on the closure part and the sleeve permitting rotation of the closure part by the sleeve in said closing direction
65 and permitting rotation of the sleeve relative to the

closure part in said reverse direction in a first axial position of the sleeve relative to the closure part, and engageable means on the closure part and the sleeve permitting rotation of the closure part by the
70 sleeve in said reverse direction in a second axial position of the sleeve relative to the closure part, the engagement means being arranged so that they are capable of mutual engagement by axial movement of the sleeve relative to the closure part in only one
75 predetermined precise relative angular position of the sleeve and the closure part.

2. A cap according to Claim 1, wherein the sleeve and the closure part carry indicator means which are aligned in said predetermined angular position of
80 the sleeve and the closure part.

3. A cap according to Claim 1 or 2, wherein a first of the engagement means defines a pocket and the second of the engagement means is received in the pocket in said predetermined angular position.

85 4. A cap according to Claim 3, wherein the first engagement means has a ramp surface engageable by the second engagement means to deflect the latter away from the pocket when the sleeve and the closure part are not in said predetermined angular
90 position.

5. A cap according to Claim 4, wherein the first engagement means is provided on the closure part which also has outwardly projecting lugs captivating the sleeve on the closure part, the lugs having ramp
95 surfaces engageable by the second engagement means to deflect the latter.

6. A cap according to Claim 3, 4 or 5, wherein one side of the pocket is defined by a wedge surface which co-operates with a corresponding wedge
100 surface of the second engagement means with the latter engaged in the pocket and being turned in said reverse angular direction.

7. A cap according to any one of Claims 2 to 6 including deflecting means adjacent the pocket
105 mouth to deflect the second engagement means away from the mouth during relative rotation of the closure part and the sleeve.

8. A child-resistant cap constructed substantially as herein described with reference to the accompanying drawings.
110

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.